The Community Assessment Project
Durham, North Carolina

CEHI

Children's Environmental Health Initiative

a research, education, and outreach program committed to fostering environments where all children can prosper
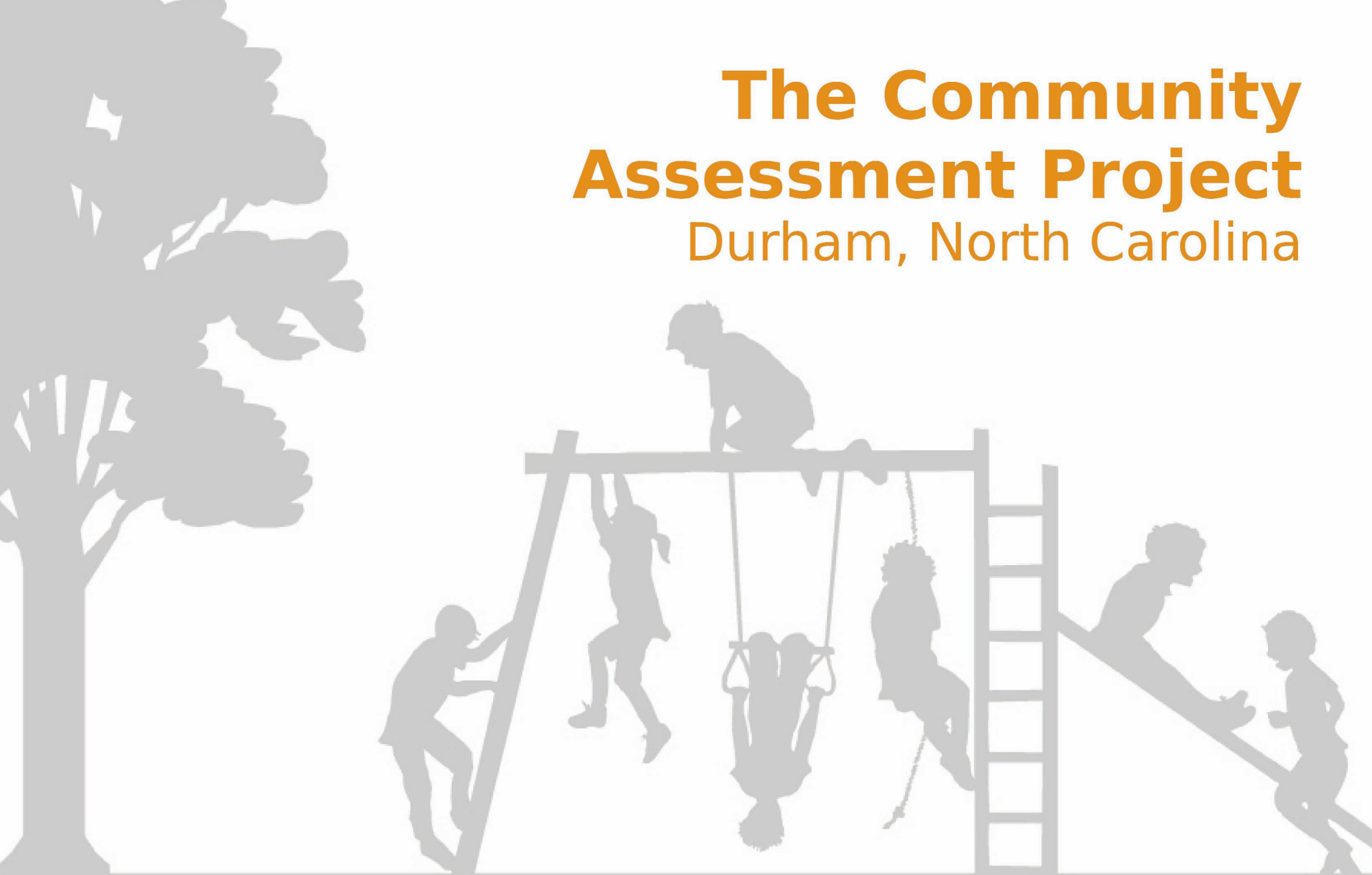
The Built Environment
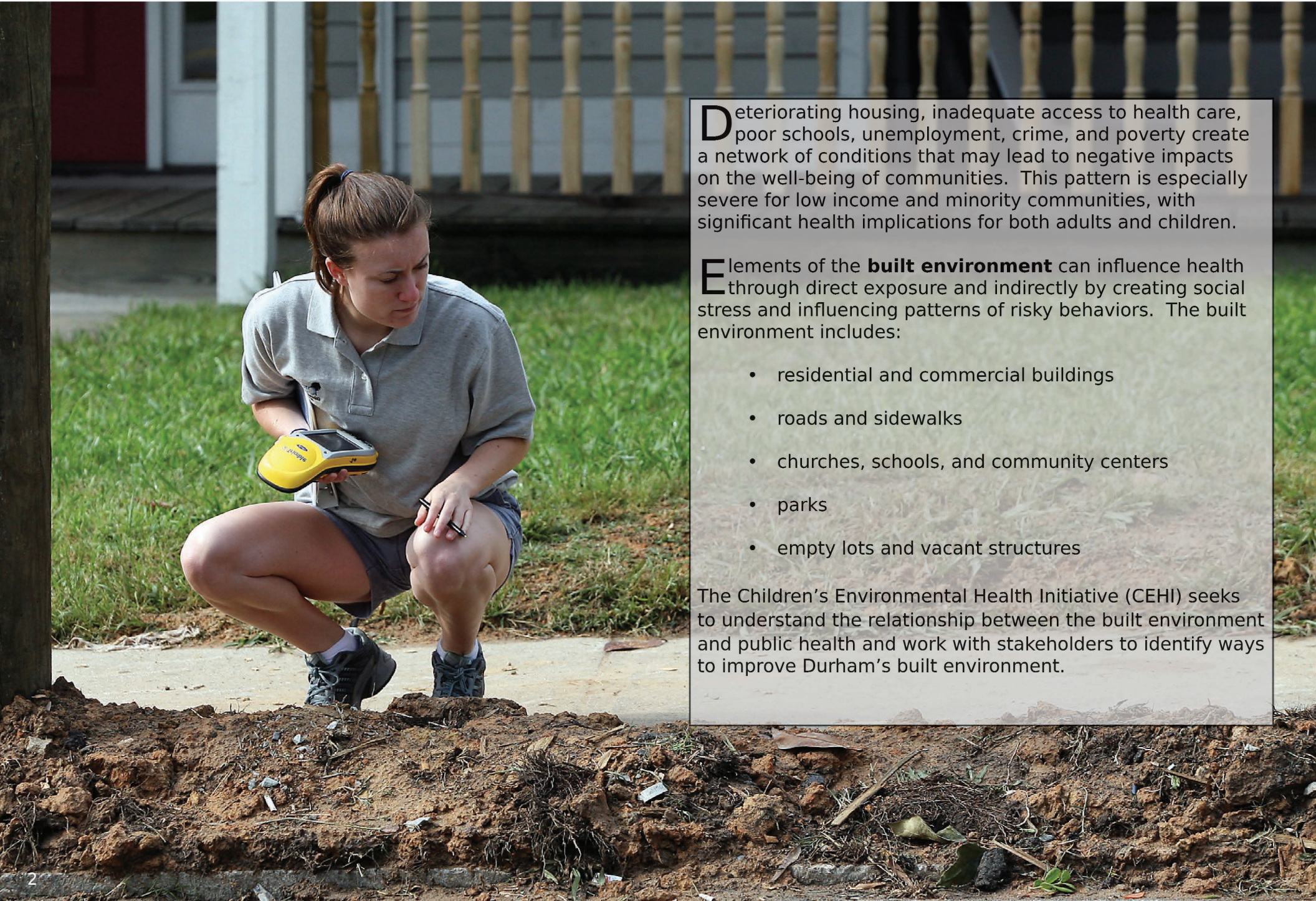
Deteriorating housing, inadequate access to health care, poor schools, unemployment, crime, and poverty create a network of conditions that may lead to negative impacts on the well-being of communities. This pattern is especially severe for low income and minority communities, with significant health implications for both adults and children.

Elements of the **built environment** can influence health through direct exposure and indirectly by creating social stress and influencing patterns of risky behaviors. The built environment includes:

- residential and commercial buildings

- roads and sidewalks

- churches, schools, and community centers

- parks

- empty lots and vacant structures

The Children's Environmental Health Initiative (CEHI) seeks to understand the relationship between the built environment and public health and work with stakeholders to identify ways to improve Durham's built environment.

Motivated by increasing evidence regarding the relationship between public health and the built environment, the Community Assessment Project was conceived with two key goals:

- Provide community residents with maps of the built environment to support residents' efforts to improve quality of life; and

- Elucidate the relationship between the built environment and health.

Six key themes underlie the Community Assessment Project:

1. Housing characteristics

2. Neighborhood conditions

3. Community resources

4. Food access

5. Neighborhood safety

6. Demographics

Conducting the Assessment

F rom May to August 2008, CEHI data collectors canvassed over 17,000 tax parcels in Durham using a standardized visual assessment of building exteriors. Sidewalks and nuisance variables like graffiti or litter were recorded, as were the presence of community assets, such as religious institutions, parks, and community centers. Assessments were conducted using handheld computers equipped with global positioning system (GPS) technology.

Figure 1 shows the areas included in the Durham Community Assessment Project. The project area captures most residential neighborhoods in Durham's "urban core".

MAP KEY
- Durham Tax Parcels
- CEHI Project Areas
- Durham County
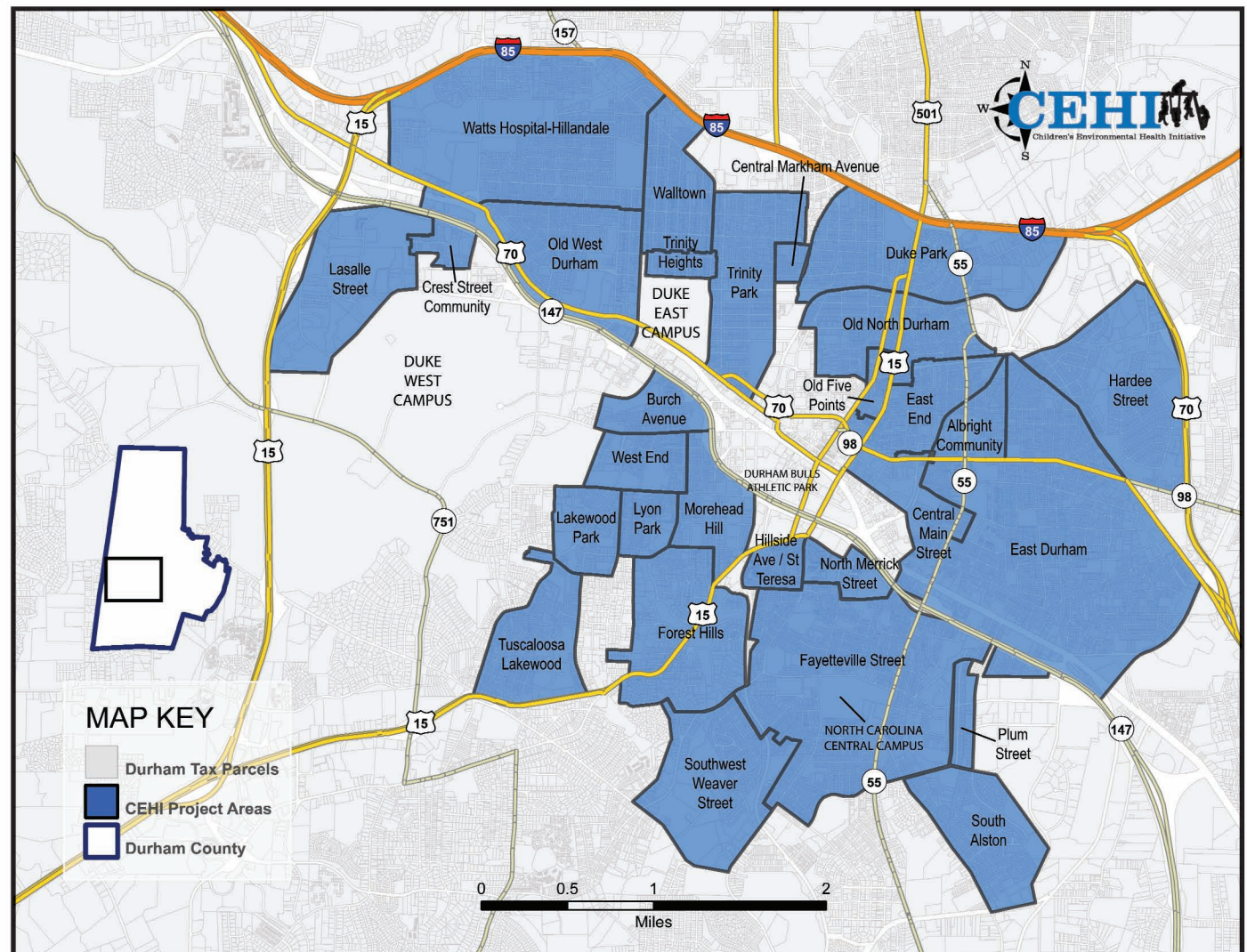
The neighborhood outlines used in **Figure 1** are based on boundaries that were provided to CEHI by the Durham Department of Geographic Information Systems (GIS). In some cases, CEHI modified these outlines to expand the area covered by the Community Assessment Project.

Data were collected on every individual tax parcel (each building and the land on which it is located) in each of the Central Durham neighborhoods. The U.S. Census defines areal units such as blocks, block groups, tracts, and zip codes to conduct surveys and report data. A Census block is the smallest of these units and roughly corresponds to city blocks. The maps presented in this report take individual tax parcel data and aggregate them up to the Census 2000 block level.

The data displayed in maps are grouped into five equal percentiles, called "quintiles". The first quintile contains the top 20% of the data. The second has the next 20% and so on, for a total of five quintiles. A consistent color scheme was used for all maps, in which darker colors emphasize the variable of interest.

To supplement the data collected by CEHI during the summer of 2008, CEHI obtained additional data from external sources, including:

- Assessed tax value, from the Durham County Tax Assessor's Office

- Crime incidents, from the Durham Police Department

- Demographics, from the U.S. Census 2000

- City-wide locations of health care providers, K-12 schools, and day care centers from Polk City Directories.

Housing Characteristics: Housing characteristics and conditions help describe the state of the built environment and provide critical information on the health of communities. These maps are based on data fom the Durham Community Assessment Project, as well as from the Durham County Tax Assessor's Office.
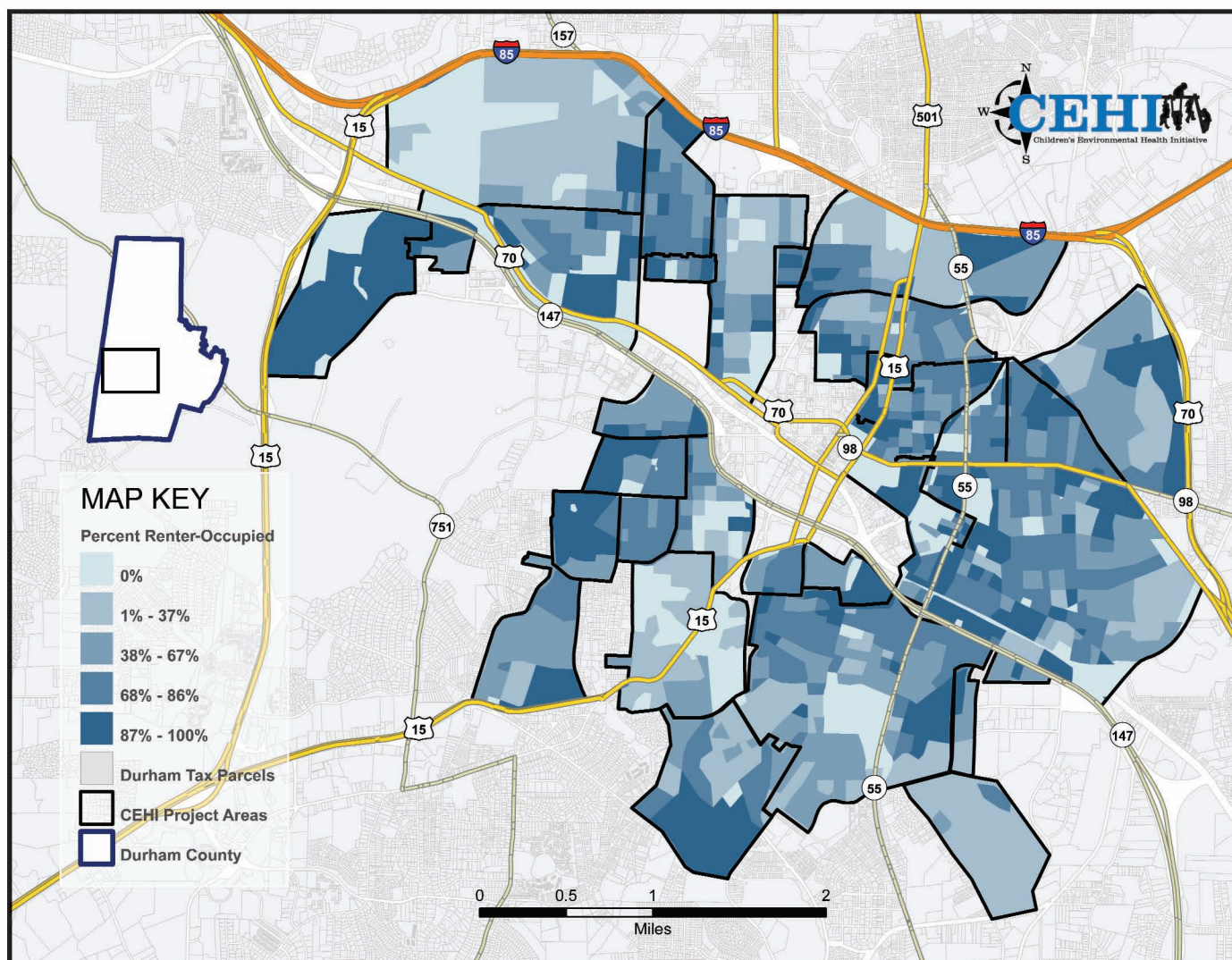
Assessed Tax Value: Figure 2 shows the average assessed tax value of parcels in each Census 2000 block; the darker the color, the lower the assessed tax value.
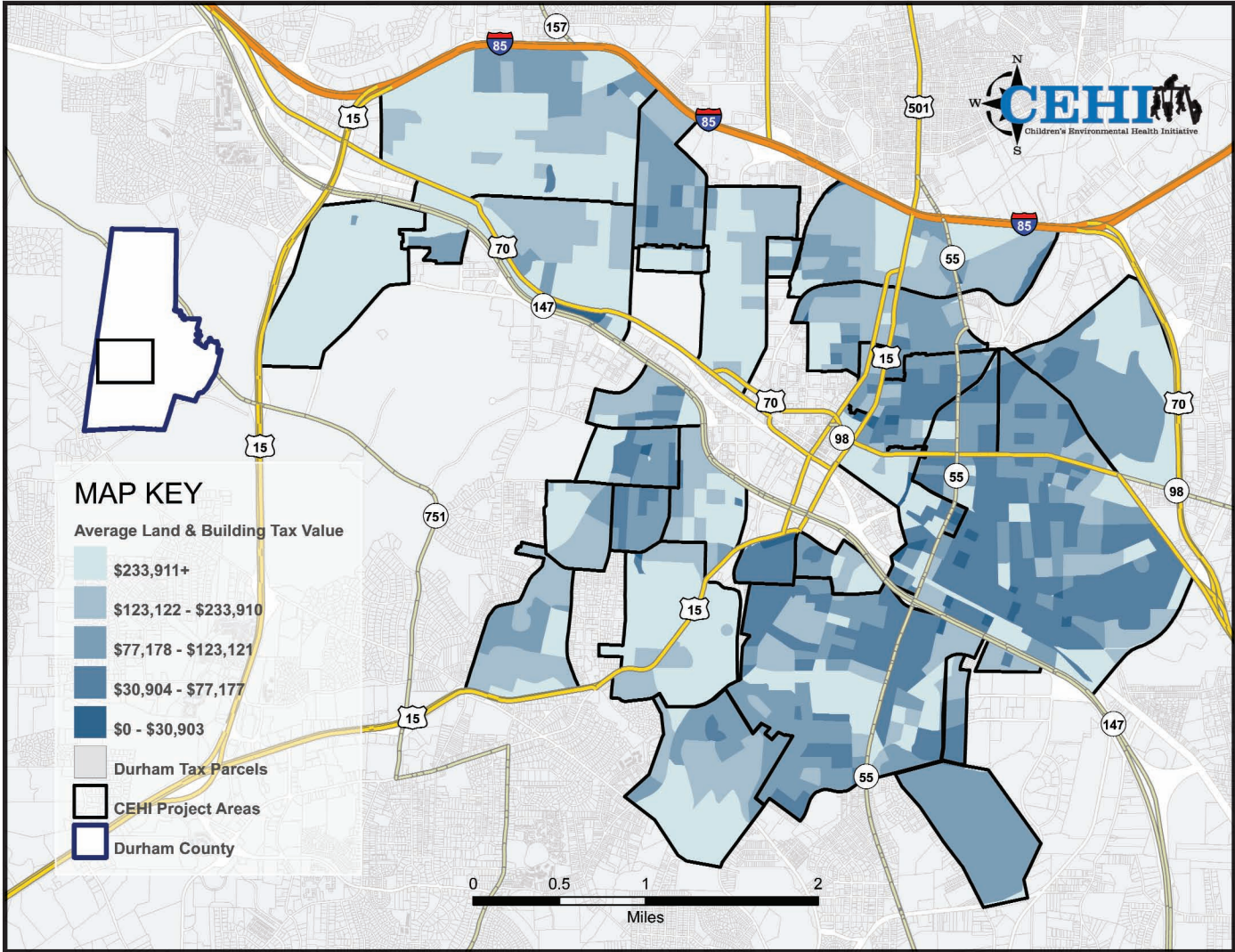
Renter-occupancy: A high percentage of renter-occupied housing often indicates a less stable community, with residents and landlords less deeply vested in overall neighborhood health.

Figure 3 shows the percentage of estimated renter-occupied residential parcels in each Census 2000 block. Estimates were made by matching physical address information with owner address information from the Durham County tax parcel data; the darker the color, the higher the percent renter-occupied.

MAP KEY

Percent Renter-Occupied

- 0%
- 1% - 37%
- 38% - 67%
- 68% - 86%
- 87% - 100%
- Durham Tax Parcels
- CEHI Project Areas
- Durham County

Unoccupied Parcels: Vacant properties may serve as locations for activities that are generally viewed as unacceptable to the public. Vacant homes and empty lots may encourange unhealthy behaviors such as crime, vandalism, or drug and alcohol abuse.
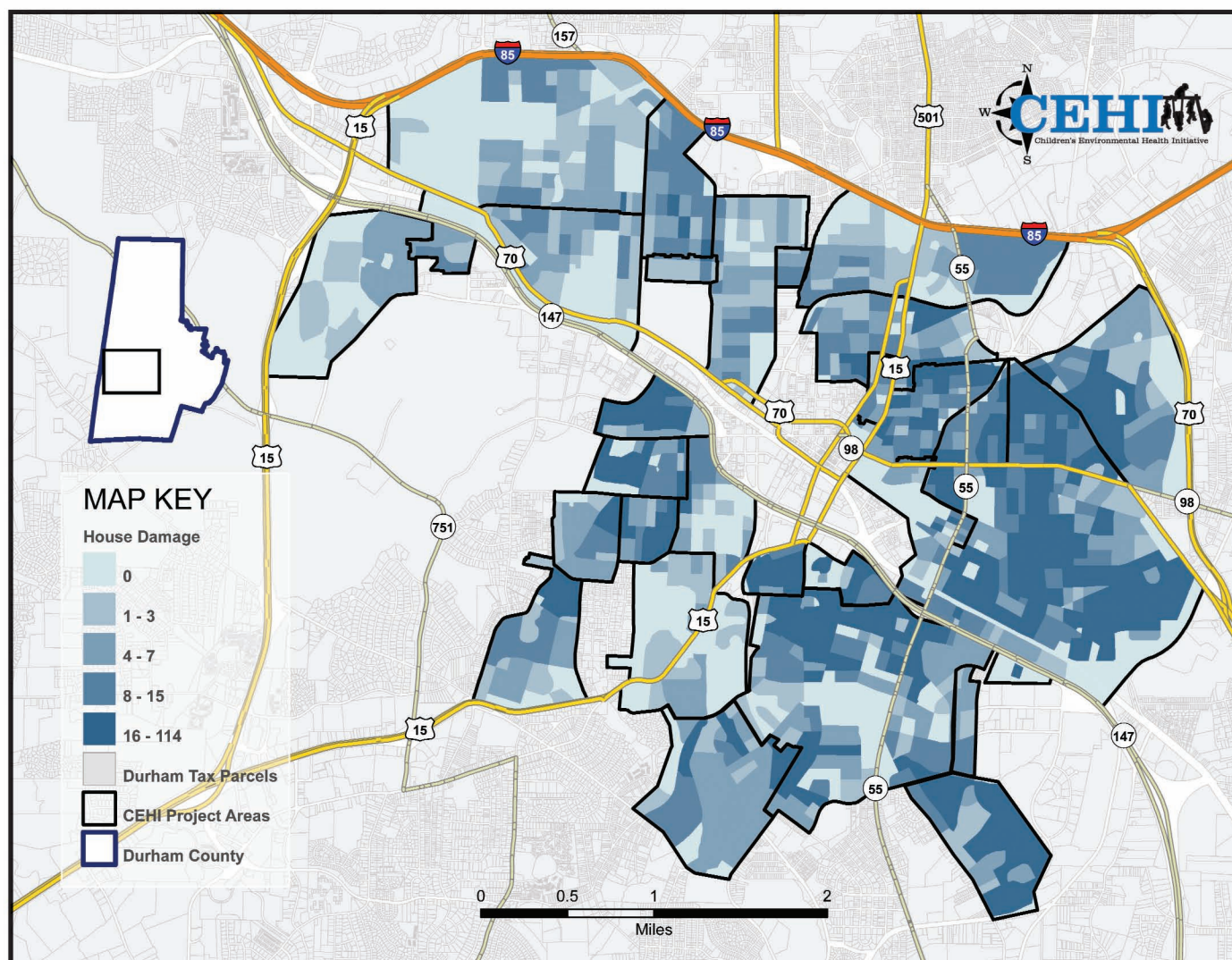
Figure 4 shows the unoccupied parcels observed during the assessment. This includes observed empty lots, unoccupied residential properties, and vacant commercial properties in a block but excludes properties possessing a "for sale" or "for rent" sign. Each Census 2000 block is assigned a value corresponding to the total number of observed unoccupied parcels; the darker the color, the greater the number of unoccupied parcels.
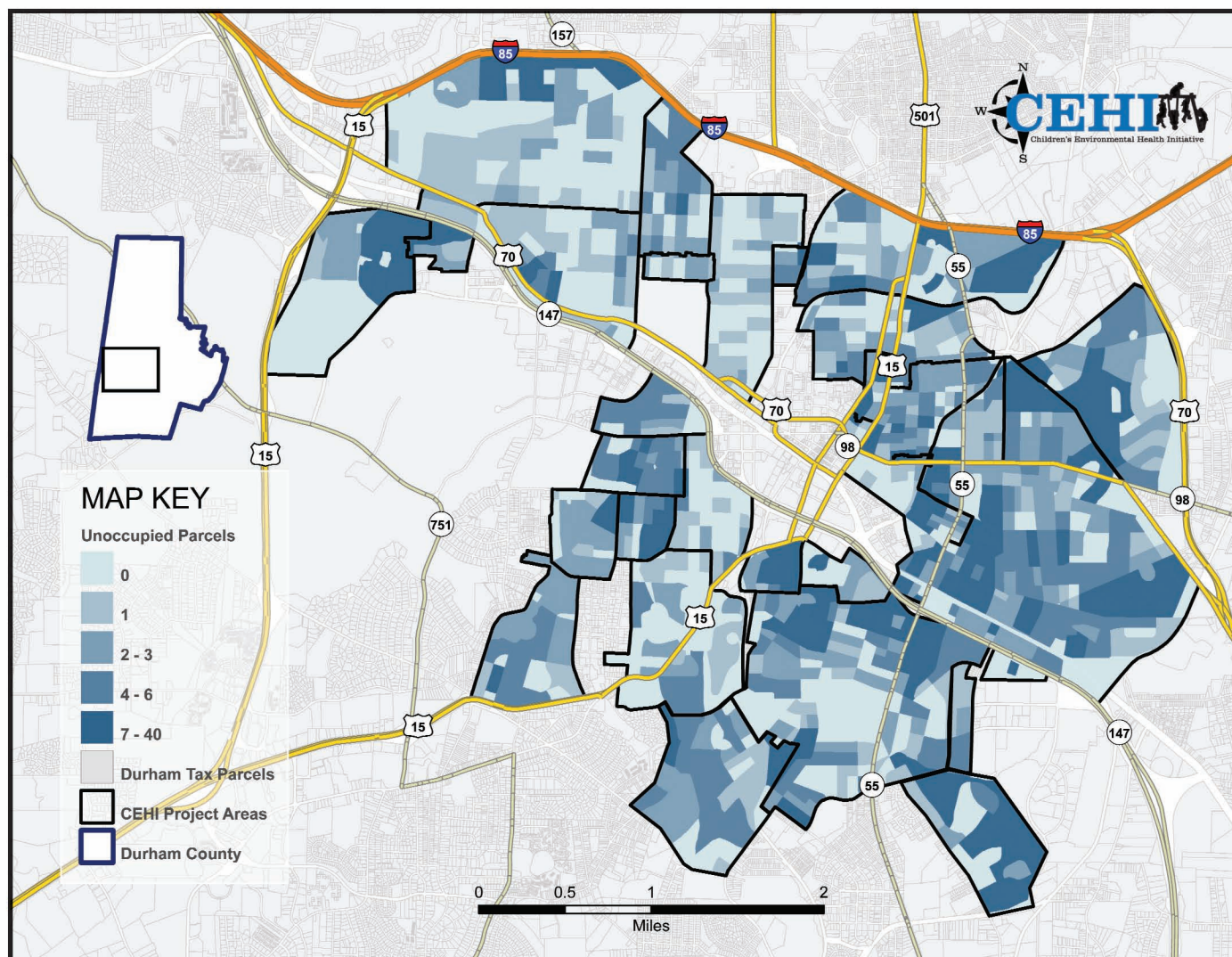
Housing Damage: Housing damage, especially if it is concentrated in a particular area, may affect physical, mental, or emotional health.
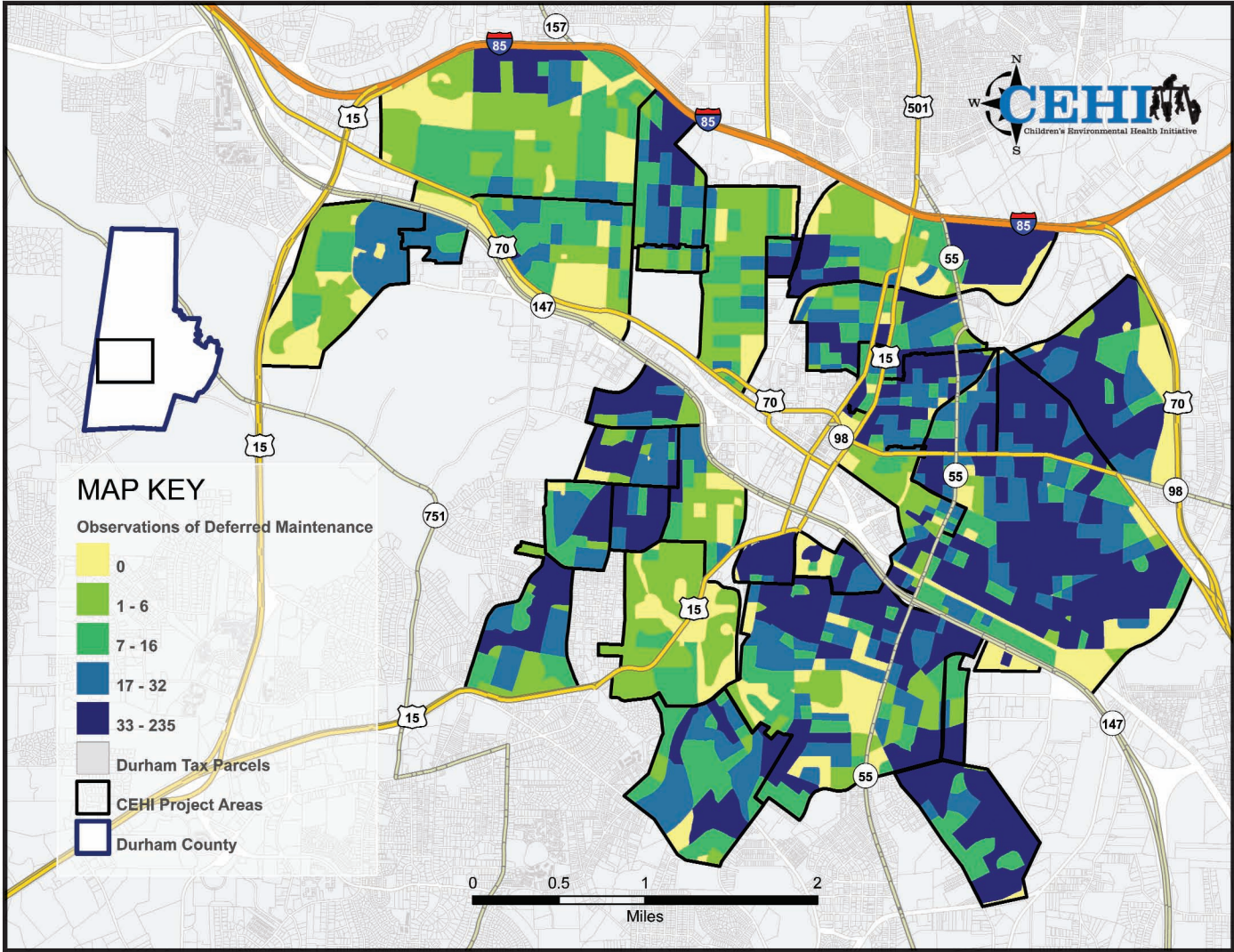
Figure 5 shows total number of observations of structural damage for each Census 2000 block. Observations of structural damage include broken windows, boarded windows, boarded doors, holes in walls, roof damage, chimney damage, foundation damage, front entry damage, door damage, peeling paint, and fire damage. Darker blue blocks have higher counts of observed housing damage; the darker the color, the greater the number of observations of structural damage.

MAP KEY

House Damage

- 0
- 1 - 3
- 4 - 7
- 8 - 15
- 16 - 114

Durham Tax Parcels

CEHI Project Areas

Durham County

0   0.5   1   2

Miles

Neighborhood conditions represent a broad approach to summarizing observations in a community. While including housing damages, it also extends to landscaping in residential areas and nuisances in public spaces. The impact of neighborhood conditions on human health is similar to housing conditions.
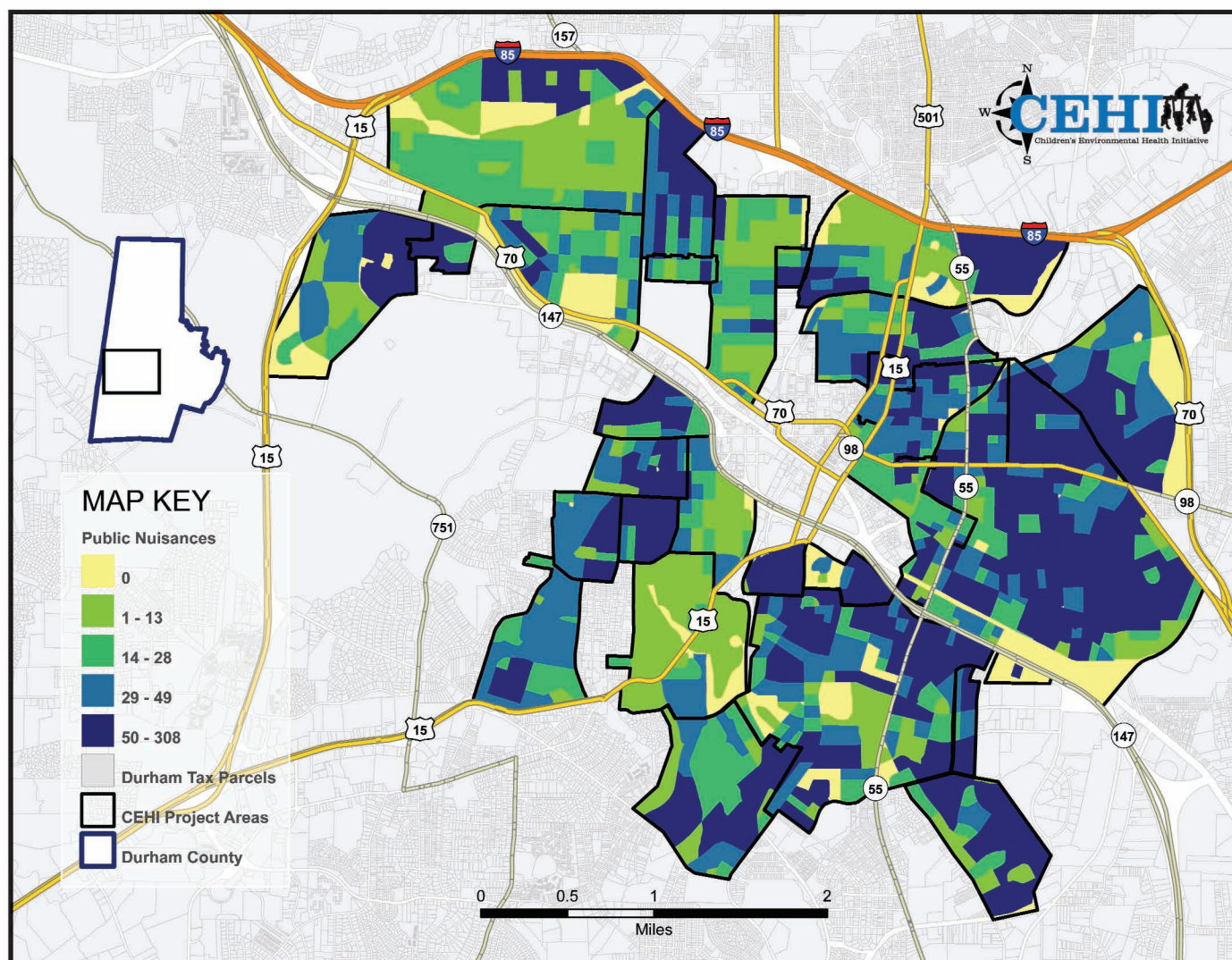
Figure 6 shows the total observations of deferred maintenance, encompassing both housing and residential landscapes, for each Census 2000 block. Observations of deferred maintenance include broken or boarded windows, holes in walls, roof damage, chimney damage, foundation damage, front entry damage, peeling paint, fire damage, condemnation notices, standing water, excess litter, garbage, broken glass, discarded furniture, discarded appliances, discarded tires, inoperable vehicles in the yard, high weeds or grass, graffiti, and fence damage. The darker the color, the greater the number of observations of deferred maintenance.

MAP KEY

Observations of Deferred Maintenance

- 0
- 1 - 6
- 7 - 16
- 17 - 32
- 33 - 235
- Durham Tax Parcels
- CEHI Project Areas
- Durham County

0   0.5   1   2
Miles

Public Nuisances: Litter, garbage, and other offensive materials discarded or left in public spaces also contribute to neighborhood conditions. Furthermore, the types of nuisances observed may indicate the behaviors that are considered acceptable in that community. While deferred maintenance describes tax parcels, public nuisances only include observations in public spaces such as roads and sidewalks.

Figure 7 represents the total number of public nuisances observed per Census 2000 block. Such nuisances include: graffiti, discarded shopping carts, furniture, and appliances, broken glass, excess litter, food garbage, dog waste, drug paraphernalia, condoms, cigarette litter, alcohol containers, tires, batteries, fallen telephone or electrical wires, damaged storm drains and meter covers, articles of clothing, construction debris, deep holes, and discarded baby diapers. The darker the color, the greater the number of observations of public nuisances.
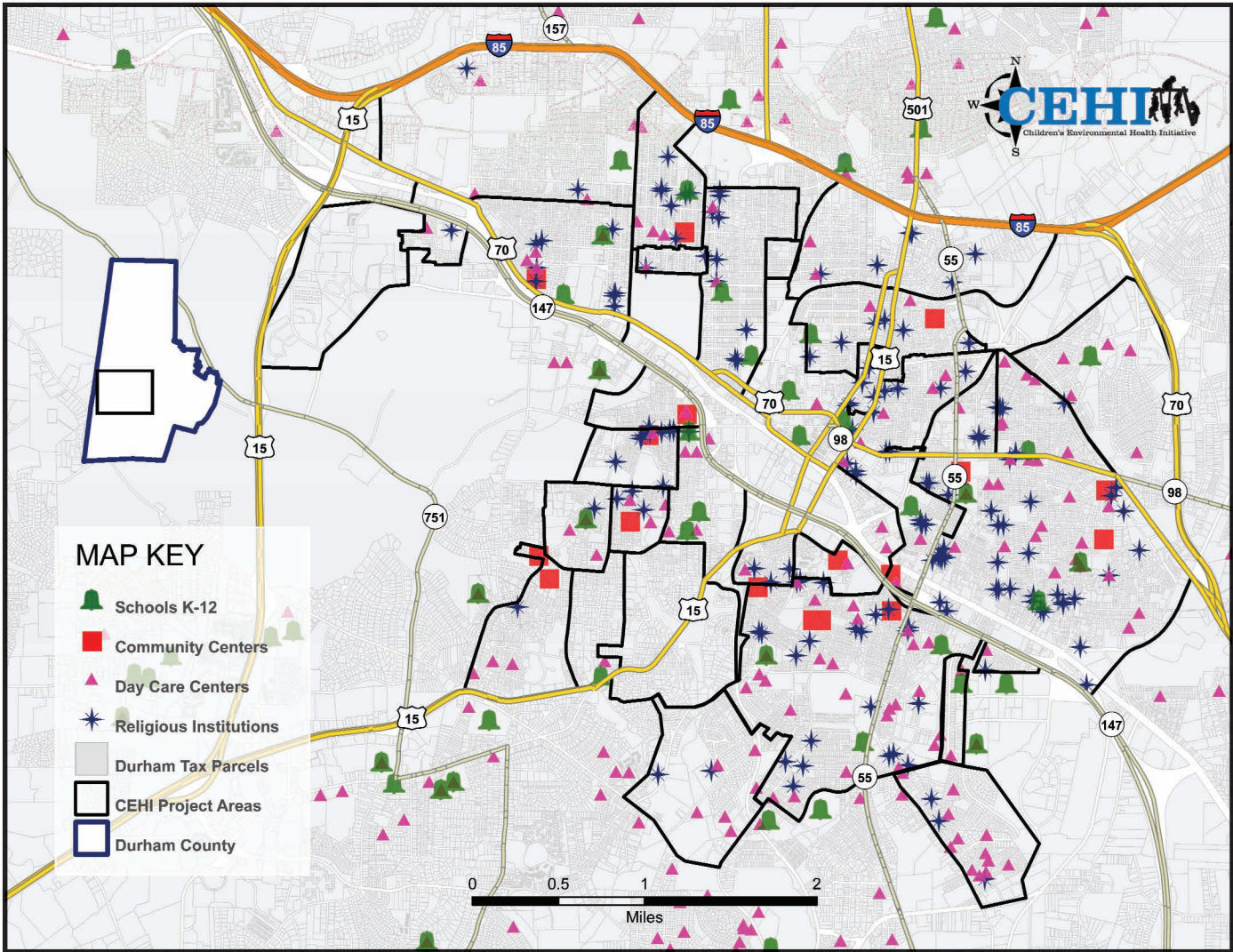

MAP KEY

Public Nuisances

- 0
- 1 - 13
- 14 - 28
- 29 - 49
- 50 - 308
- Durham Tax Parcels
- CEHI Project Areas
- Durham County

Community Resources: Community health is closely connected to the availability and proximity of resources such as parks, community centers, schools, and day care centers. Each resource contributes to the community by providing a space for gatherings, community worship, or education. Community centers are places for physical activities, educational opportunities, and community events.

Figure 8 shows the locations of all schools, community centers, religious institutions, and day care centers.
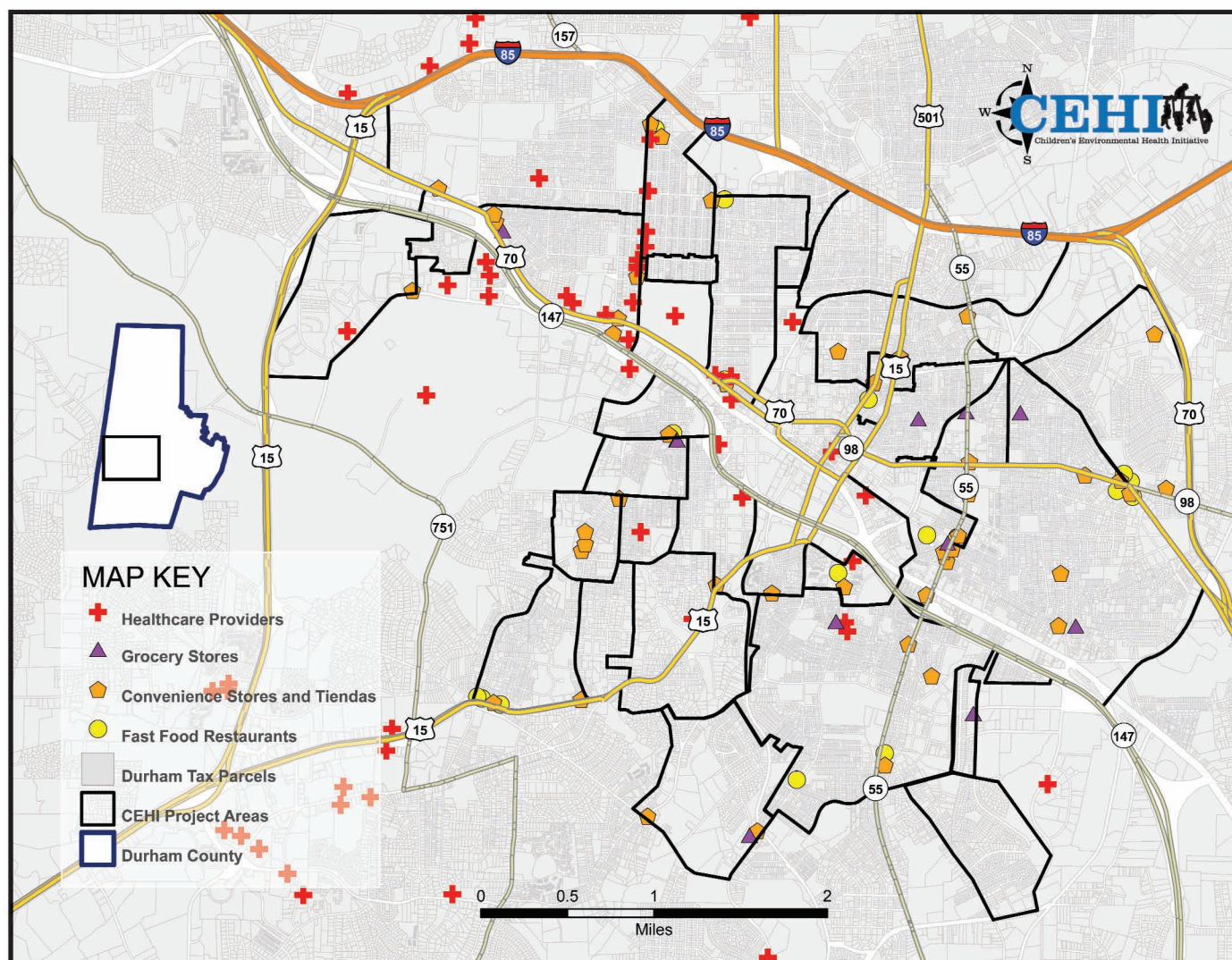
Total Number of Resources on Map
- Community Centers: 17
- Religious Institutions: 152
- Day Care Centers: 188
- Schools: 51

MAP KEY
- Schools K-12
- Community Centers
- Day Care Centers
- Religious Institutions
- Durham Tax Parcels
- CEHI Project Areas
- Durham County

Food Access and Health Care: Childhood obesity is an increasing health problem, particularly in the American South. The abundance of stores offering inexpensive and calorie-dense foods may be contributing to the rise in childhood obesity. However, the presence of grocery stores provides healthier options for residents. Similarly, the distribution of physicians and health care providers affects residents' access to appropriate health care.

Figure 9 presents the locations of convenience stores, tiendas, fast food restaurants, grocery stores, and health care providers.

Total Number of Resources on Map
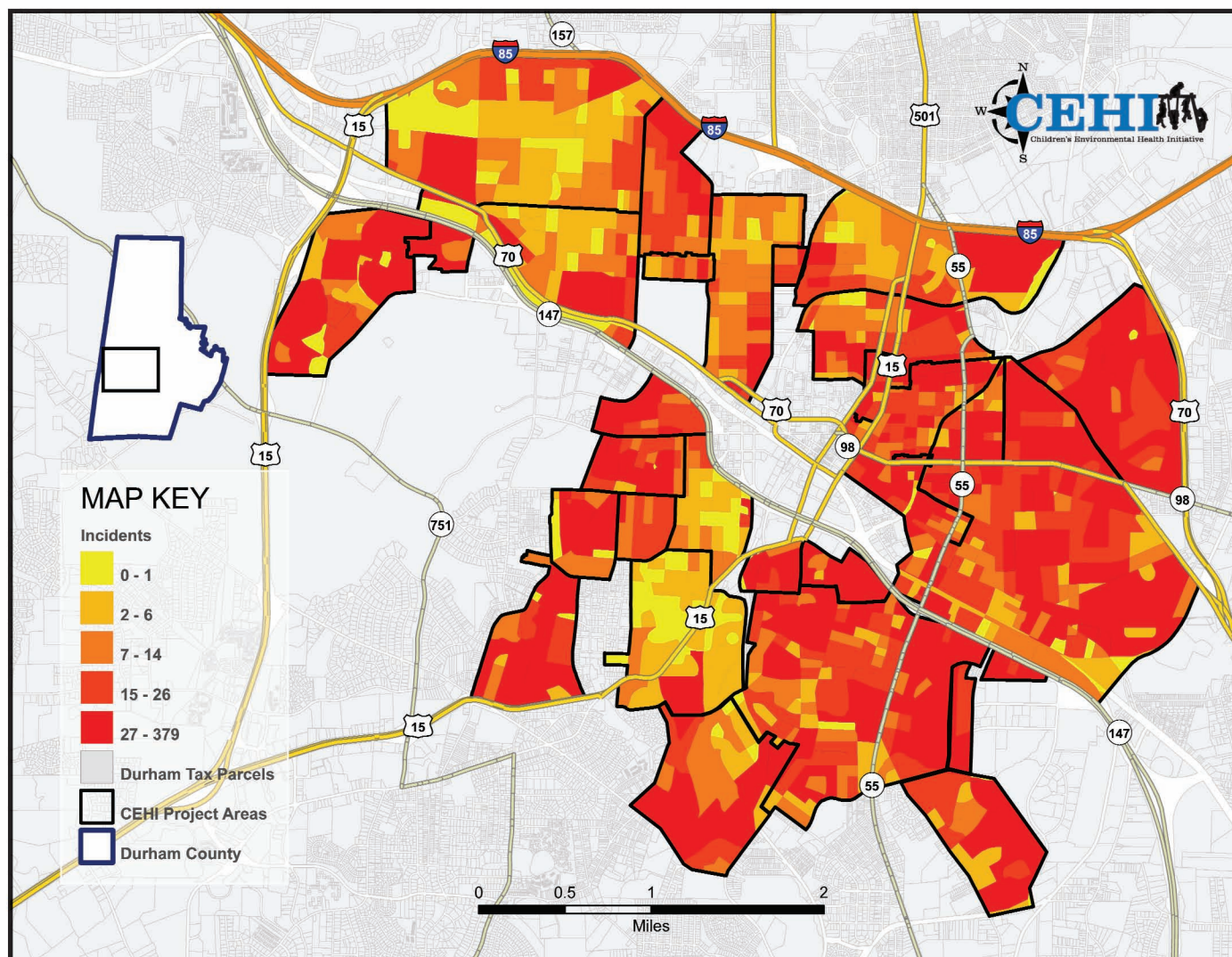- Healthcare Offices/Providers: 186
- Fast food: 17
- Convenience Stores/Tiendas: 44
- Grocery Stores: 12

MAP KEY
- Healthcare Providers
- Grocery Stores
- Convenience Stores and Tiendas
- Fast Food Restaurants
- Durham Tax Parcels
- CEHI Project Areas
- Durham County

Neighborhood Safety: Living in an area characterized by high crime rates or frequent police activity may contribute to high stress levels in individuals. Stress is a known risk factor in the development of hypertension, diabetes, and heart disease.
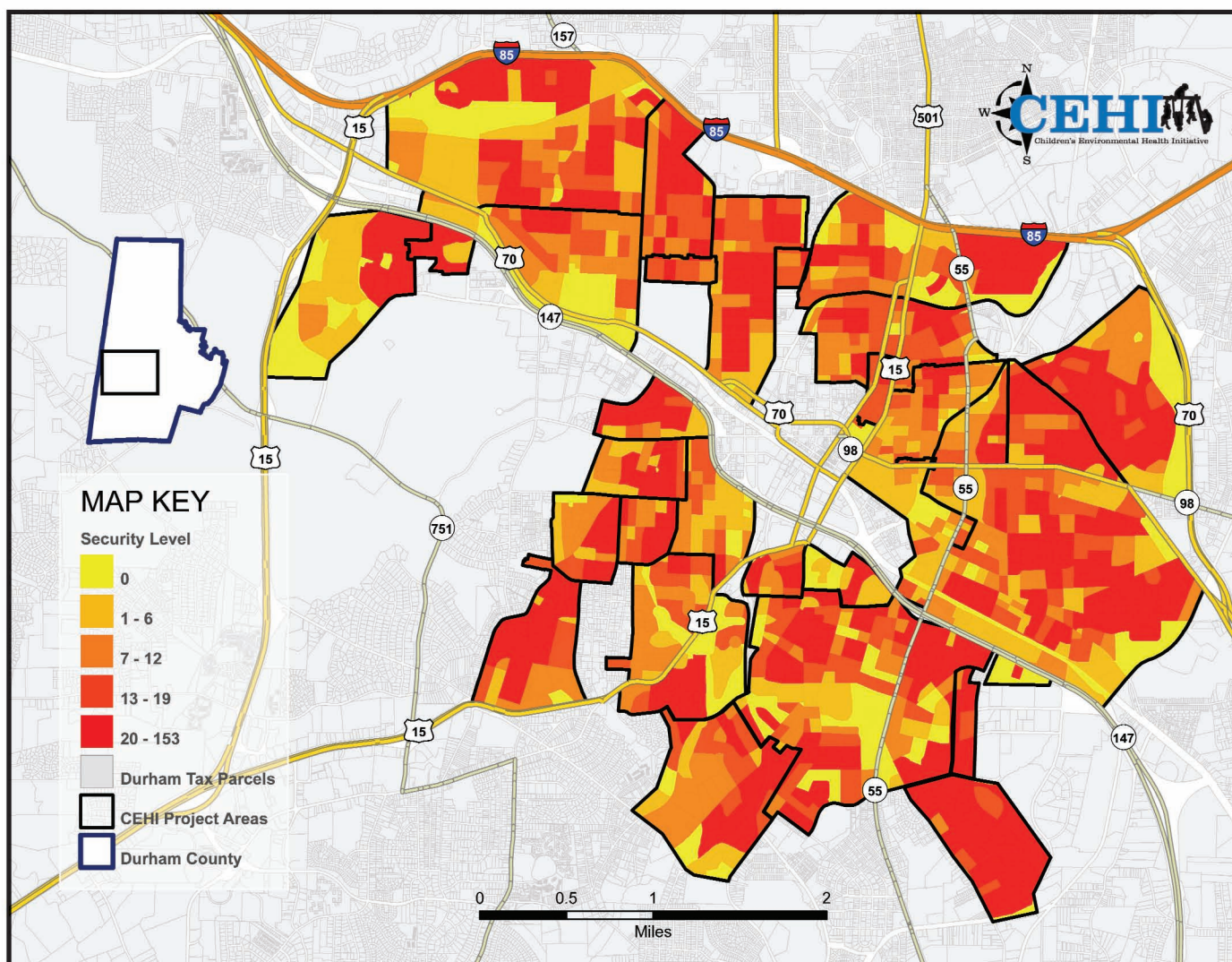
Crime Incidents: A crime incident is defined as a single event in which police were called to the scene. **Figure 10** shows the total number of crime incidents per Census 2000 block; the darker the color, the greater the number of reported crime incidents. The data presented are from 2006-2007.

MAP KEY

Incidents

0 - 1
2 - 6
7 - 14
15 - 26
27 - 379

Durham Tax Parcels

CEHI Project Areas

Durham County

Security Level: Certain variables highlight security measures residents use to protect themselves and their families. The presence of "No Trespassing" signs, security signs, and barbed wire along fences may indicate a lack of trust among neighbors or a fear for one's safety.
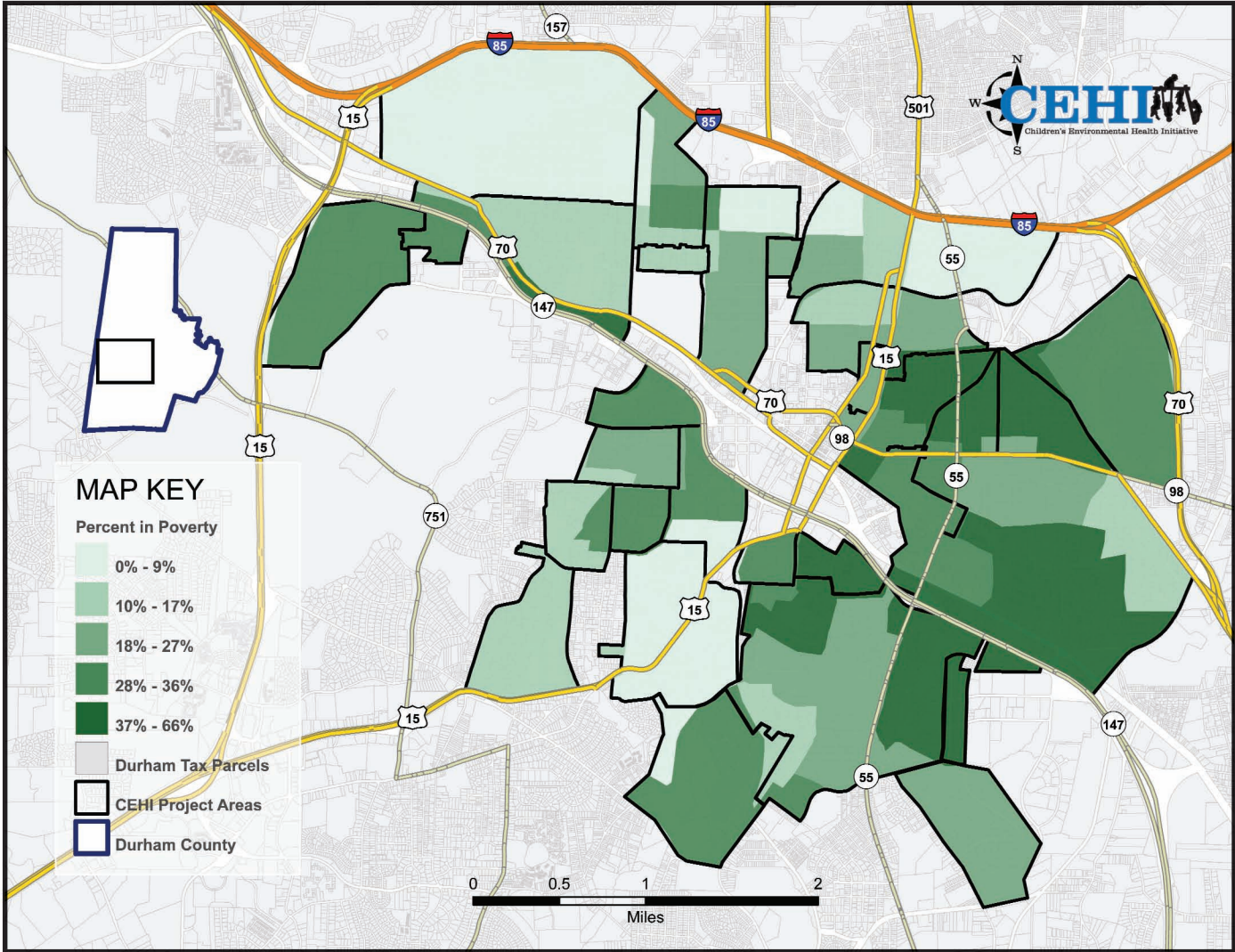
Figure 11 shows the total number of observed security measures per Census 2000 block. These measures include security signs, fences, barbed wire, no trespassing signs, and beware of dog signs; the darker the color, the greater the number of observed security measures.
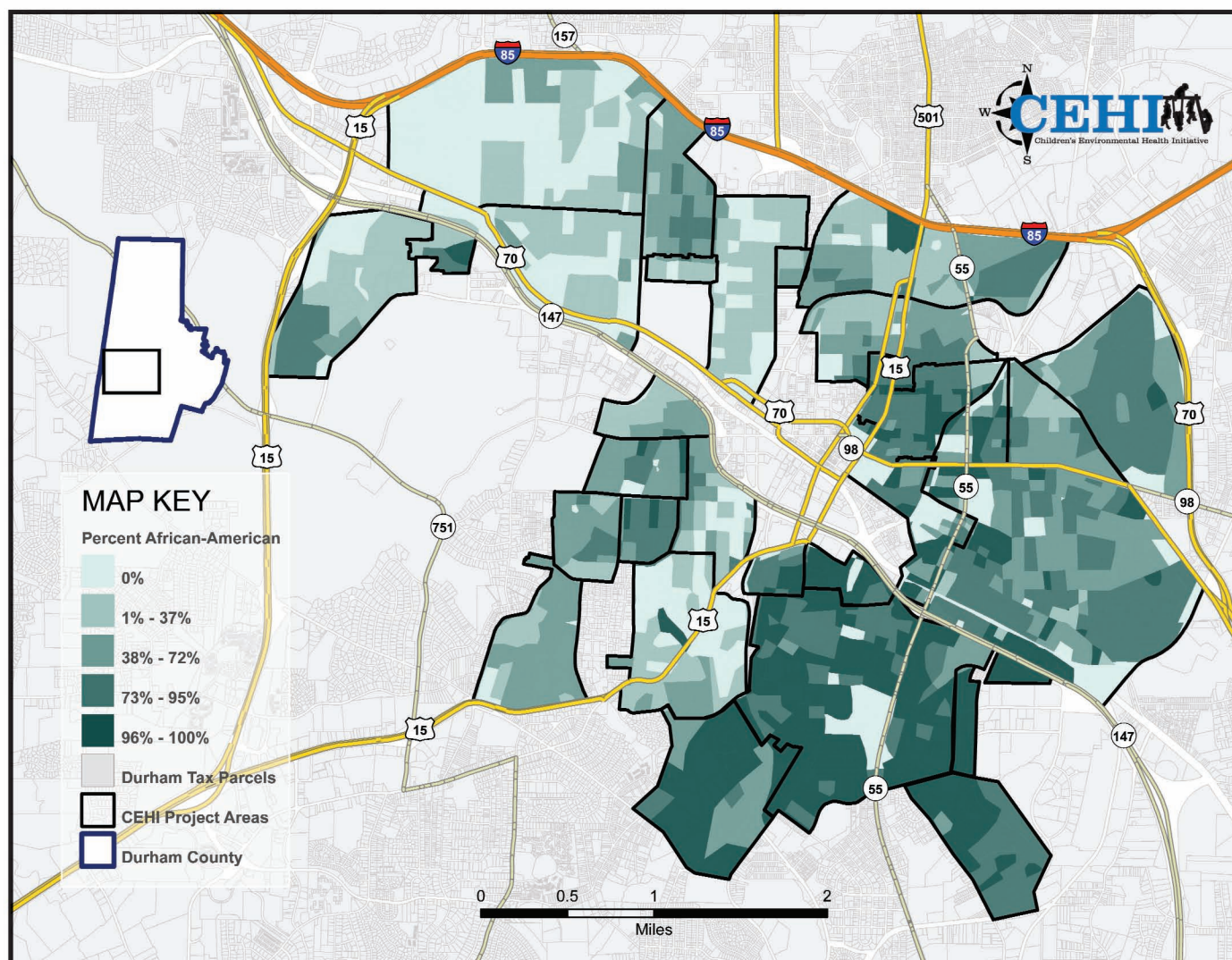

MAP KEY

Security Level

- 0
- 1 - 6
- 7 - 12
- 13 - 19
- 20 - 153
- Durham Tax Parcels
- CEHI Project Areas
- Durham County

0   0.5   1   2
Miles

Demographics: Demographic data describe populations and supplement the Community Assessment Project. Comparing demographic information such as income, highest level of education achieved, age, gender, and race to the built environment data collected in the Community Assessment Project may reveal trends that identify vulnerable or susceptible populations.

Percent of the population living in poverty: The poverty line is defined by the U.S. Census Bureau and is dependent on the total number of people in the household and the number of children. **Figure 12** shows the percentage of the population for each Census block group (unavailable at the block level) living below the poverty line, based on U.S. Census 2000 data (latest available); the darker the color, the higher the percentage of persons living in poverty.
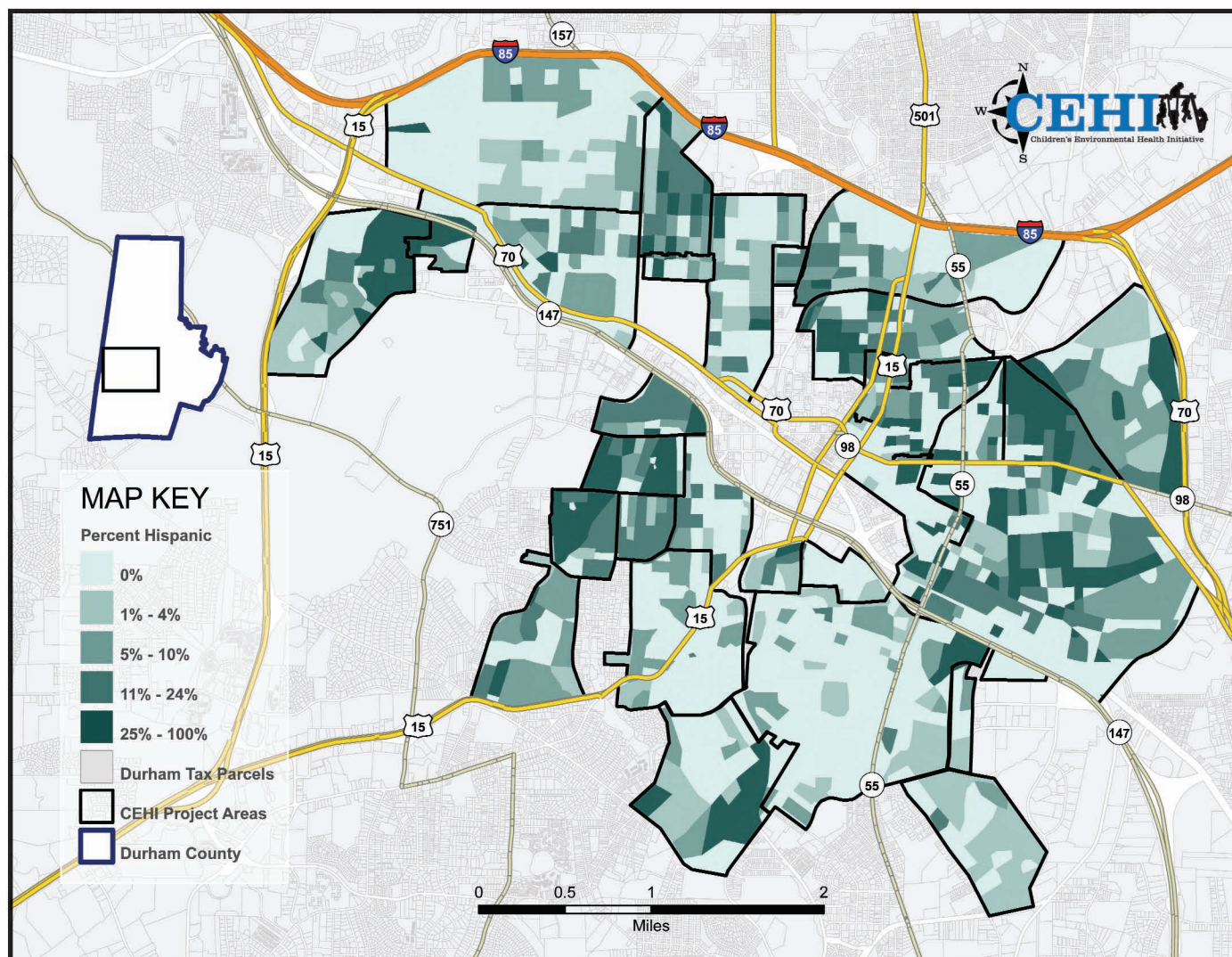

MAP KEY

Percent in Poverty

- 0% - 9%
- 10% - 17%
- 18% - 27%
- 28% - 36%
- 37% - 66%
- Durham Tax Parcels
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Percent African American: **Figure 13** shows the percentage of the population that is African American for each Census block, based on U.S. Census 2000 data (latest available); the darker the color, the higher the percentage of African-Americans.

MAP KEY

Percent African-American

- 0%
- 1% - 37%
- 38% - 72%
- 73% - 95%
- 96% - 100%
- Durham Tax Parcels
- CEHI Project Areas
- Durham County

Percent Hispanic: Figure 14 shows the percentage of the population living within a Census block that is Hispanic, based on U.S. Census 2000 data (latest available); the darker the color, the higher the percentage of Hispanics.

MAP KEY

Percent Hispanic

- 0%
- 1% - 4%
- 5% - 10%
- 11% - 24%
- 25% - 100%
- Durham Tax Parcels
- CEHI Project Areas
- Durham County

The Community Assessment Project can serve as a tool to assist local communities, government agencies, and other stakeholders in improving quality of life in Durham. The maps in this report display the spatial distribution of housing characteristics, neighborhood conditions, community resources, food access, and neighborhood safety throughout the project areas. These maps provide valuable information about the built environment and suggest ways that the built environment can affect the health of our communities, residents, and children. The way we interact with the built environment has an impact on our health. Increased awareness of that relationship is an important step toward creating environments where all children can prosper.

Learn More

Visit the *GIS Tools* page at: www.nicholas.duke.edu/cehi for a detailed report of the Community Assessment Project, including both pre-formatted and interactive maps. Feel free to call or email CEHI at 919-613-8708 or cehi@env.duke.edu if you are interested in learning more about the Community Assessment Project.

Marie Lynn Miranda, Ph.D, CEHI Director
Jeff Davis, Outreach Coordinator
Christopher Fresco, GIS Analyst
Gretchen Kroeger, Graduate Research Assistant
Kimberly Smith, Undergraduate Research Assistant
Rebecca Ouyang, Undergraduate Research Assistant
Melvin Gaddy, High School Research Assistant

Children's Environmental Health Initiative
E-mail: cehi@env.duke.edu
Telephone: (919) 613-8708
www.nicholas.duke.edu/cehi/

Nicholas School of the Environment
ATTN: Dr. Marie Lynn Miranda (CEHI)
Box 90328 - Duke University
Durham, NC 27708-0328